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Statement of the problem of numerical modelling of finite deformations

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Abstract

© 2014 Marat Sagdatullin and Dmitri Berezhnoi. In operation the fundamentals of a technique of numerical research of finite strains of the isotropic hyperelastic bodies, oriented on application FEM are stated. The first section is devoted kinematics of finite strains in the Lagrangian frame, tensors and measures of the strain, defining are entered speeds, various tensors of stress are reduced. In the second section physical parities of the hyperelastic isotropic environment are formulated, using the thermodynamics equations. In the third section it is reduced resolving the equation in a current configuration and the parities defining speed of change of a stress tensor of Cauchy-Euler as linear function from a tensor of a spatial gradient of speed are output.

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Keywords

A method of finite elements, Finite strains, Metric tensor